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Missouriensis is the official publication of the Missouri Native Plant Society. Founded in 1979 as a non-profit corporation, the Society is devoted to the conservation and study of the plants growing wild in Missouri, to the education of the public about the significance of the native flora and its habitat, and to the publication of related information.

Missouriensis is published quarterly by the Society. Manuscripts and illustrations are welcome, but cannot be returned unless accompanied by a stamped, self-addressed envelope. Contributions should be submitted in duplicate to Erna R. Eisendrath, Box 1137, Washington University, St. Louis, MO 63130.

Rules for submission of manuscripts are as follows: Typed on 8½ x 11-inch paper with one-inch margins; titles centered on page. Paragraphs should be typed single-space in block style, with double-spacing between paragraphs. Manuscripts should be signed and the author's address given briefly at the top of the article immediately beneath the title. Text of the article should follow two spaces below. We request that manuscripts be limited to three pages. Drawings and/or maps should be submitted in black or india ink. Bibliographies and/or references should be limited to a necessary minimum using abbreviations. Send change of address information to: Richard Daley, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

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Minutes of Last Meeting

Missouri Native Plant Society Board Meeting
Joplin, Saturday, September 12, 1981

Having been assured that all orders for luncheon had been taken, President Paul Redfearn called the meeting to order by 12:25 p.m. In attendance were the following board members: Melvin Conrad, Richard Daley, Erna Eisendrath, Karen Haller, John Karel, Ginny Klomps, Kenton Olson, Paul Redfearn, Wallace Weber, and Jim H. Wilson. Other society members present: Arthur Christ, Catherine Filla, Rebecca Haefner, Doug Ladd, Dorothy Leake, Mary Lehmann, John Molyneaux, Sherry Morgan, Wanda Oskin, Jay Raveill, Alice Redfearn, Garry Reese, and Joanna Turner.

MINUTES: With the sole addition of the fact that Art Christ had been in attendance, the minutes of the last Board Meeting, June 13, 1981, were approved as read.

TREASURER'S REPORT: Richard Daley reported a balance of the Society's account of $2,775.02.

MEMBERSHIP COMMITTEE REPORT: Jim Henry Wilson suggested adding Richard Daley to this Committee. Approved.

OLD BUSINESS: Operation Wild Flowers. Ginny Klomps reported on the continued interest of the Federated Garden Clubs of Missouri, in regard to the beautification of the highways. It was suggested that the Secretary of the Missouri Native Plant Society pen a letter of support to the Chairman of the Federated Garden Clubs of Missouri, as well as a letter of commendation to the Missouri State Highway Department in regard to its new policy of reduced mowing.

NEW BUSINESS: Doug Ladd circulated copies of a four page proposal for a mechanism to continuously update and document the known distribution of the Missouri flora. After much discussion, the Board approved the proposal. The proposal, in its entirety, will appear in the next issue of Missouriensis.

AMENDMENTS TO BY-LAWS: Dave Castener, Wallace Weber and Jim Henry Wilson are studying several suitable amendments to the present By-Laws and will submit their suggestions at the December Board Meeting.

MISSOURIENSIS: Erna Eisendrath reported expenses of commercially producing the last issue to be around $300, and was authorized to have the next issue produced in the same way. At present mailing adds greatly to the cost, but it is hoped that the Society will soon have a bulk-mailing permit.

POLICY ON BOARD MEETING NOTIFICATION: It was decided that individual notification of the agenda for each meeting need only be sent to Board Members, with publication of place, time, and other particulars to be decided upon sufficient early for publication in Missouriensis. Dates for several future meetings are firm: December 5, 1981; March 6 and June 5, 1982. However, location of only the first of these has been firmly established (Editor's note: see pg. 4); it will be held in St. Louis, at the Missouri Botanical Garden. Melvin Conrad promises to supply detailed plans for the others.

RECENT PUBLICATIONS: Several talented members have recently seen their books published: Spring Wildflowers of Missouri State Parks, by Bruce Schuette, Paul Nelson; Misssouri Orchids, by Bill Summers; Ozark Wildflowers, by Dorothy Leake.

CONCLUSION: After a timely reminder by Sherry Morgan regarding the reauthorization of the Endangered Species Act in early 1982, the meeting ended in time for an afternoon tour of Diamond Prarie. (See pg. 4)

Respectfully submitted,

Karen S. Haller, Secretary

WHAT YOU MISSED

Our September meeting place and date were chosen so as to coincide with the Department of Conservation's introduction to the public of the newly purchased Diamond Prarie, 400 acres dedicated on the morning of the 12th as the latest addition to the state's Design for Conservation.

Those present were treated to a glorious day and a fascinating program which included walks and talks, sights and sounds; Indians and pioneers shared in moveable feast of activities, but for MoNPS members perhaps the greatest thrill was to see in bloom those two typical "tall-grass" prairie symbols, Big Bluestem(Andropogon gerardii) and Indian Grass(Sorghastrum nutans),along with tall forbs such as several species of Liatris, the Goldenrod characteristic of prairies(Solidago rigida), the confusingly named White Lettuce(Prenanthes alba) and the Blue Sage (Salvia azurea var.grandiflora) found mostly in the southeastern areas of the state. It was difficult to look down, as one walked through these plants, but lowered eyes were often rewarded with glimpses of the small yellow Linum sulcatum, the strange little flowers of a Milkwort (Polygala) and, most stunning of all, the Downy Gentian(Gentiana puberulenta) the conspicuous blue of its wide-open corolla outdoing the clear sky itself!

It was of course impossible to list all the plants that were blooming if one followed one's conscience back to the luncheon meeting of our society. It was also impossible to visit the near-by George Washington Carver National Monument, near the town of Diamond, in which that distinguished American agricultural researcher grew up.....but, as implied by the minutes of our meeting, much was accomplished; and we can rest assured that the plants of Diamond Prairie will bloom in other years(and months) and that we can pay our respects to Dr.Carver at another time.....

OUR NEXT MEETING

The meeting will be held in St. Louis, December 4-5 at the Missouri Botanical Garden. Members of MoNPS are invited to convene informally, at 7 p.m. on Friday the 4th in the Green Room of the Lehmann Building, to hear talks by Marshall Crosby, Director of Research, and Nancy Morin, Chairman of the Botany Department, on the history of botanical research at the Garden. Following the talks we will adjourn to the Museum Building for refreshments.

On Saturday, December 5, members are invited to join tours of the research facilities - both the library and the herbarium - beginning at 9:00 a.m. The Board will convene at noon for its meeting.

PATIENCE AND THE WHITE OAK

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The virtue of patience, especially when borne with confidence, is always viewed as an admirable quality. The white oak (Quercus alba), however, seems to begin its existence with an opposite tendency. Its acorns, all of which mature in early September, after one summer's growth, seem eager to germinate a root almost as soon as they fall; that is, just before winter. This is unusual, as most plants whose seeds ripen at this season, including the red oaks whose acorns take two years to ripen, have at least enough patience to wait until spring for the irreversible process of germination.

Another unusual characteristic is that, on the average, in 2 years out of every three, white oaks hardly produce any acorns at all. However, in the third year they produce in quantity, and the ground underneath becomes littered with hundreds -- sometimes thousands -- of oblong, ripening acorns, which, with the first autumn rain begin to germinate. Then most of them will extend their radicles, or primary root tips, towards the soil. We can assume that the ones which do not are damaged internally, often by the larvae of acorn weevils or of tiny, highly specialized moths; careful whittling with a pocket knife will often expose the culprits if they have not already escaped into the ground to pupate. But even those that germinate successfully face other problems.

Where the ground is covered with a thick carpet of leaf litter, survival of white oak acorns is quite limited. There the growing tips of young roots are unable to reach down to mineral soil before the physiological drought of winter's first hard freeze. They have a better chance on bare soil where they can penetrate an inch or two before stopping growth. In any case, the vast majority of white oak's highly palatable acorns are consumed by wild turkeys, woodpeckers, jays, quail, deer and rodents -- particularly squirrels.

The gray and fox squirrels are special agents. They do have the habit of burying acorns in autumn even while they do not, as some people believe, have the ability to recall just where. What leads them to dig up acorns in lean days of winter is not memory but a keen sense of smell; they sniff around until they locate a buried prize. What this means, of course, is that unless they sniff every square foot of a woodland, they are surely apt to pass up acorns which in spring will renew growth as new seedling oaks. None of this does much to explain why the white oak is so impatient to germinate in autumn. One theory is that squirrels pass up germinated acorns because they may have been subjected to physiological changes which make them distasteful; problem is, nobody has ever really communicated with the rodents to get their opinions. The impatience of white oak acorns to germinate in autumn is, no doubt, a virtue favorable to their chances in the big gamble to produce a legacy of seedlings wherever and however possible.

What is really of importance, if they are to survive at all, is a tendency to establish quick security underground -- that is, to grow a deep taproot that can store food. Thus it is to their advantage to get a head start before their first growing season above ground. By the time a typical white oak seedling opens its three to four leaves during the first spring, it already has a root thick as a pencil which extends down more than 12 inches.

Then, in contrast to its germinating behavior, the new seedling begins to exhibit great patience. In the second year its taproot may extend two feet downward while its modest crown remains less than one foot high and bears less than a dozen leaves. Unless it is in full sunlight, it is apt to remain a small, obscure shrub for many years. This has great survival value because if a deer chews off the top, or if a fire scorches it down to the root crown, the underground reserve will save its life; again and again, the taproot will prevail.

Patience in a tree, as in any living thing, has its virtues only when it is beneficial to its well being. The white oak, even as a seedling, knows this well.

WILDFLOWERS I HAVE GROWN

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ALLIUM STELLATUM: Establishes large clumps in full sun or under rock-garden conditions. Also self-seeds freely. Flowers from September to October.

ANEMONE CANADENSIS: Very easy from seed. Forms dense clumps. Highly aggressive through seeding and root-growth. A long display of flowers, April through June. An excellent border-forming plant. Height ca. 20".

ARISAEMA DRACONTIUM: Seeds germinate readily. Aggressive plant in shade. Under garden conditions they grow easily to 3 feet tall. Corms become fairly large and A. dracontium will crowd other plants if permitted. Flowers in April. Fruits brilliant red in late fall.

ARISAEMA TRIPHYLLUM: Habitat same as A. dracontium but not as aggressive under garden conditions, though it spreads readily. I have a specimen, which grew this year (1981) to 3 feet tall. Flowers in April, fruit turns bright red in September.

ASCLEPIAS INCARNATA: Arrived as an adventive in my garden. While the flowers are showy, the plant spreads rapidly through seeds. The most disturbing feature is a constant battle with a yellow aphid, which specializes on members of the Asclepiadaceae. As the natural habitat is wet bottomlands, watering during dry spells is necessary. Plants grow to 6 feet tall.

ASTER LONGIFOLIUS: Seeds obtained at Sandy Ridge, Jefferson County. Poor germination. Plants become very large under cultivation and flower profusely.

ASTER NOVAE ANGLIAE: Best started from fleshy roots (stolons). Grows into a very large clump, which must be staked. For maximum flowering, the shoots should be pinched back several times in the fashion of Chrysanthemums. Prolific display of flowers in a wide range of colors. Clumps must be divided annually. Grown in this way, the stalks are from 6 to 7 feet tall. Full sun. Water when dry in summer. Likes considerable moisture under natural conditions.

CAMPANULA AMERICANA: Selfseeds any place in garden. Probably biennial, forming a rosette during first year and flowering during the second. Likes shade. Flowers in late July and early August. A white-flowering form appeared in my garden but did not persist.

CASSIA MARILANDICA: From seed collected in St. Charles bottomlands. Very vigorous - to $7\frac{1}{2}$ feet tall. Perennial. Flowers from last third of July on.

CHELONE OBLIQUA: Grown from rootstock, which had been plowed under in the Mississippi bottomland just north of Hannibal, Mo. The plowing had probably been done just a few hours before my arrival. Roots, which are fleshy, were kept in plastic bags with water and planted a few hours later. Growth occurred almost immediately and a large number of specimens were re-grown. They bloomed very freely for years, grew to 7 feet tall, and spread widely. Considerable watering was done in summer. The entire stock has been replanted on Conservation Department lands between St. Charles County and Hannibal. As far as known, the transplanting was successful, despite the very dry summer of 1980.

COLLINSIA VERNA: An annual, which self-seeds readily in humus-rich soil. Germination usually during October with cotyledons staying green all winter. Excellent companion plant for the larger spring-flowering garden bulbs, but must be restrained. While in the wild, C. verna seems to grow exclusively in open shade, it will do equally well in the sun in the garden.. I pull the plants when seeds ripen, pile them on a tarp, and collect the seeds as they fall to the bottom of the pile. Have successfully introduced C. verna into several valleys, where they thrive. I have grown the rarer C. violacea but cannot keep the plants from crossing with C. verna.

DICENTRA CUCULLARIA: Grows readily from seed in fully shaded woodland area. Good drainage is essential for survival and hillsides with eastern or northern exposure provide best habitat. Blooms early April. Foliage disappears by late May.

DICENTRA CANADENSIS: Same conditions as D. cucullaria but drainage is even more important. In the wild found almost exclusively at the bottom of north facing wooded hills.

DODECATHEON MEADIA: Seed obtained from commercial source. Excellent germination. Total failure in trying to transplant seedlings into pots at different trials. I suppose that seed must be sown directly where plants are desired.

GENTIANA ALBA: Very rare in Missouri. Should be on "endangered" list. Good germination from wild plants in Warren County. Not too choosy as to habitat, but seems to prefer a "mini-glade". Flowers in October. I intend to reintroduce my stock into the wild.

GENTIANA ANDREWSII: From seed. Multiplies readily. Tolerates morning sun, but prefers shade. Selfseeds readily. Observed during many years that seedlings come up thickly along limestone slabs and in the crevices of slabs. Do not know if this means an affinity for lime. After flowering freely in October for over 10 years, the plants became diseased with foliage turning pale green.

HETEROTHECA LATIFOLIA: Easily grown from seed. Very free-flowering under garden conditions. Selfseeds readily. Flowers late August through September. No special care needed.

IRIS FULVA: Have grown for well over 25 years. Does well in St. Louis. Roots must be divided, as overcrowding occurs as in most iris species. As this species is at home in wet habitats, watering during dry summer weather is needed. Grows readily from stratified seed.

IRIS VIRGINICA: Easily grown from seed after winter stratification. Flowers extremely variable in color patterns. Grown in light shade with early morning sun. Flowers regularly.

LITHOSPERMUM LATIFOLIUM: This is a rare (and possibly endangered) species with small, not showy flowers. Seed (5 seeds) collected in Lost Creek, Warren County. One seed germinated and grew into a much branched plant. It was left where it germinated and NOT transplanted. Flowering period is nearly 2 months: late April to June. Grew very well (and is still in good shape) on an elevated, shaded spot. Total height of plant about 2'.

LOBELIA CARDINALIS: Germination easy after stratification. Needs water. Grows into large clumps. Must be divided after 2nd year to maintain vigor. Stalks to 6 feet tall easily laid over by storms unless staked. Flowers late July to August.

MIMULUS ALATUS: Very easy from seed. Selfseeds freely and therefore not desirable in garden. Full sun or shade; no particular requirements. Flowers in July.

NEMASTYLIS GERMINIFLORA: Obtained during a road-shoulder operation near Bonne Terre, where plants were being destroyed by the hundreds. Based at least 10" below soil level in the stickiest clay imaginable, but in well drained localities. They flowered for 3 years in my garden, then disappeared.

OENOTHERA MACROCARPA: Easy from seed, when grown in poor soil mixed with limestone rubble and in good drainage. While flowering profusely, in my garden, seed did not form apparently because necessary pollinators were absent. Grown on a miniature "glade" situation. Plants become sprawling after flowering.

OENOTHERA TRILOBA: Grown from stock received from eastern Illinois. Does well on poor soil with limestone rubble. Flowers over a period of 2 months - about middle of April to June. Very floriferous. Flowers open at dusk and are fully opened in 2 - 3 seconds. All flowers close before dawn unless very cloudy weather exists. Selfseeds readily, but transplanting is probably impossible as the seedlings form tap roots. However, clumps of seedling have been transplanted without wilting. In contrast to O. macrocarpa, which has the stigma protruding from the bud hours before the flower opens, O. triloba does not have this feature.

POLYGONATUM CANALICULATUM: Very aggressive under garden conditions. Seems to prefer some protection from afternoon sun, though the most vigorous specimens I have seen grow on a south-facing railroad embankment in the wild.

RUDBECKIA TRILOBA: Four years ago a friend, who has a farm near Steelville, saw a plant with red-centered flowers on her property. I have since then raised specimens from seed annually. The appearance of a deep red inner circle on the ray flowers is NOT mentioned in Steyermark. However, other Rudbeckia species seem to have this color variant. During the 1st two years the ratio of red-rayed plants to all yellow was about 1:8. Now, in the 4th year of seed selection, all but one plant have red-centered rays. One plant is outstandingly red and I will select seed from it. R. triloba makes very tall, bushy plants under garden conditions and, as it is covered with flowers for a long time, is spectacular. Flowers from late July through early September and grows to about 6'.

SANGUINARIA CANADENSIS: Does well under oak trees. Corms should remain undisturbed for years. Spreads through seeds. Areas receive a yearly application of leafmold in late fall and are kept weeded.

SILENE REGIA: Grown from seed collected in northern Jefferson County. Germination good after stratification over winter. Seedlings transplanted into various "habitats" in garden. Those provided with agricultural lime in rocky soil mixture seem to do best, though all survive. Flowering stalks of over 5 feet have been measured. S. regia, besides being very showy, has one of the longest flowering seasons of any wildflower, beginning to bloom in early May and still having some

flowers by late July. As the species grows naturally in rocky situations, often at the edges of woodland, it seems to demand good drainage rather than rich soil.

SILENE VIRGINICA: Grown from seed. Germination slow and intermittent after stratification in sand. Does well when exposed to some sun; specimens grown in full shade died. This is perplexing, as the species is often found in shady woodland situations. Does NOT like competition for space...this seems to be an important factor. Flowers for about 3 weeks in late April. Note: In southwest Missouri there were many fine specimens in full flower during the 1st week of June in 1981.

SISYRINCHIUM CAMPESTRE: Easily grown from seed. Wants sun and cannot tolerate competition from other plants. Flowers in May, but as flowers only open during a few hours on sunny days, S. campestre does not contribute much to a garden.

SPIGELIA MARILANDICA: A small clump, given to me years ago, has increased considerably in size and has been divided. The plants grow in rich garden soil and receive an application of leafmold yearly. They are located on a slight slope, facing east, and thus receive morning sun 'til approximately 11 AM. There is a tendency to wilt during the first hot days of early summer, while later in the season there is no sign that the morning sun is too hot for the plants.

Flowering is profuse over a period of approximately 3 weeks during May. Seed production is poor and the few seeds that are present disappear during the nights. I have not been able to determine what animal gathers them. Seeds can be obtained only by wrapping the flowering stalks with a protective covering. The plants are watered regularly during summer dry spells. Division of clumps does not seem to disturb S. marilandica. During the wet summer of 1981 a 2nd set of flowers bloomed in late July.

STYLOPHORUM DIPHYLLUM: Grows readily from fresh seed. Very aggressive self-seeder. Needs shade from afternoon sun. Spreads rapidly in humus-rich soil and flowers freely. Main flowering during April, but some flowers produced during entire summer. No particular cultural requirements.

TALINUM CALYCINUM: Seed sown in a special, raised mound, consisting mainly of sand, rubble and not much soil. Germination perfect. Plants form rhizomes and persist year after year. Fine display of flowers in afternoon from late June through July. At home on sandstone outcroppings in hot sun.

VIOLA PEDATA: After many failures, these were grown successfully when I provided a slope with a soil-rubble-limestone mixture. Plants now do well and flower well. As V. pedata cannot tolerate competition from other plants, weeding is important.

Editor's Note: For those members of MoNPS who would like to try the cultivation of wildflowers for themselves, the following list of wildflower sources has been copied from Horticulture, May 1981:

SEEDS

Applewood Seed Company
P.O. Box 4000
Golden, Colorado 80401

Clyde Robin Seed Company, Inc.
P.O. Box 2855
Castro Valley, California 94546

Environmental Seed Producer, Inc.
P.O. Box 5904
El Monte, California 91734

Far North Gardens
15621 Auburndale
Livonia, Michigan 49021

Herbst Brothers, Seedsmen
1000 North Main Street
Brewster, New York 10509

J. L. Hudson
P.O. Box 1058
Redwood City, California 94064

McLaughlin's Seeds
P.O. Box 550
Mead, Washington 99201

PLANTS

Appalachian Wildflower Nursery
Rt. 1, Box 275A
Reedsville, Pennsylvania 17084

Garden Place
6780 Heisley Road
Mentor, Ohio 44060

Great Lakes Wildflowers
Box 1923
Milwaukee, Wisconsin 53201

Gurney Seed and Nursery
Yankton, South Dakota 57078

Horticultural Systems
P.O. Box 70
Parrish, Florida 33564

Midwest Wildflowers
Box 64
Rockton, Illinois 61072

G. W. Park Seeds Co.
Greenwood, South Carolina 29647

F. W. Schumacher Co.
36 Spring Hill Road
Sandwich, Massachusetts 02563

Nature's Garden
Route 1, Box 488
Beaverton, Oregon 97007

Putney Nursery, Inc.
Route 5
Putney, Vermont 05346

Siskiyou Rare Plant Nursery
522 Franquette Street
Medford, Oregon 97501

Windrift Prairie Shop
R. D. 2
Oregon, Illinois 61601

SUGGESTIONS FOR CONDUCTING A SURVEY IDEAS OF DR. STEYERMARK

During a recent visit to St.Louis several members of MoNPS had the privilege of lunching with Julian Steyermark, author of our local "botanical bible", The Flora of Missouri . Printed below are excerpts from a letter in which the distinguished visitor summarized some of the subjects that were discussed, in particular "future exploration activities that should be carried out for any serious plan to bring the Missouri flora records up-to-date."

> When I went into serious exploration of the state flora, I prepared for each of the counties the months of the year and the localities visited each month. By noting the months of those counties lacking any collections, I would attempt to visit during the months needing exploration. This was especially important where I had found important new records or range extensions in certain localities of a county visited, for example, in May, which should be revisited in fall, since many spring flowers appearing in May are not to be found in September-October, and vice versa. So by noting on my county lists what months and localities I had previously visited, I was enabled to plan future trips to new or otherwise interesting localities gleaned from a study

of detailed topographical quadrangles of the Missouri Geological Survey, literature of various counties,etc. I realized, of course, that it was impossible to visit each of the counties during each of the collecting months(Feb.-Dec., if one is checking Hamamelis vernalis,H.virginiana,etc.) but I attempted to fill in as many blanks as possible for those months lacking data for each of the counties.

So, in order to pursue anything like a logical course of exploration for new county records in order to really bring out a newly revised flora of Missouri, based on up-to-date records, it will be necessary to have devoted Missouri plant lovers make a serious schedule of activities for plant exploration during the next----years to come. In this connection, certain persons should dedicate their collecting activities to specific counties of the state, or a group of counties. The ideal situation, of course, would be to have one person for each county, preferably one who resided in that countu and is able to make first-hand observations and collections, such as E.J.Palmer did for Jasper Co., Bush for Jackson Co., Rickett and others for Boone Co., Eggert for St.Louis Co.,etc. In this way, it would not be necessary to travel long distances from one place to another. The person so involved with a given county or counties should be adequately trained or acquainted with the requisites involved in pressing and drying specimens and the data associated with the collection, such as color of flower, date of collecting, exact locality,etc. In the case of weeds or very common types of plants, it may not be necessaryto collect flowering material. In the case of rare plants, endangered species, orchids, etc., the root system should always be left intact and only an upper portion of the plant may be all that is necessary for identification. I would like to emphasize,in all cases,the necessity of having an actual pressed specimen to serve as a voucher for the identification. This is the only way we can ever check on another person's identification.*Everyone can make errors in identification, and for those in the Plant Society against collecting a plant for a permanent record, I can only reply that no serious scientific work is acceptable unless supported by evidence,and, in our case at hand. the pressed specimen is our only evidence.Unfortunately photos do not bring out the necessary differences often separating one species, subspecies, or variety from another, and in the last analysis nothing can substitute for the actual dried, pressed specimen.

Another important item in connection with the counties to be collected is that not sufficient information is yet available for most of the counties north of the Missouri River. Too much attention is concentrated on the Ozark counties, simply because people enjoy the scenery as well as the uniqueness of the natural history aspects of that part of the state. Therefore, I would like to emphasize the fact that no Missouri flora can be truly brought up-to-date without a new attack on exploration of most of the counties north of the Missouri River, and this type of concentrated collecting would have to involve a period of a number of years of intensive exploration and collections before we possessed new and significant records for a newly revised Missouri flora.Caldwell, Linn, Grundy, Schuyler, Harrison, and all the others (except Jackson, Boone, and a few others) need lots and lots of collecting. Who will do all this? It will take devoted persons to accomplish this task, and it will have to be done with regular and numerous visits. If I can find my lists which contain all the information on this score, I will have a copy made and sent to you. At

present I do not remember where I have such lists, or even if they are available. At any rate, I do have all my original collecting note books in my office in Caracas, and if worst came to worst we could have someone go through all my notebooks to get the detailed localities for each of the counties and the exact dates for every locality.

I hope that the above suggestions and thoughts on this subject will be taken seriously by your Missouri Native Plant Society.

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* the underlinings are all Dr.Steyermark's

CONGRESSIONAL ACTIVITIES OF CONCERN TO BOTANISTS

Bill Dierker
Columbia, MO

In the past months bills to amend the Lacey Act to increase penalties and include plants have been introduced in both houses of Congress. The Lacey Act was enacted by Congress in 1900 and initiated Federal supervision of interstate game. Correspondence from Dr. Faith T. Campbell of the Natural Resources Defense Council reports that hearings were held on the House bill in March and that the committee was overwhelmed by mail favoring the plant proposal. Hearings on the Senate bill were held in April. The Senate bill was considered the more preferable of the two because it included plants protected by Federal law (such as the Endangered Species Act and laws prohibiting the removal of plants from national parks and other public lands) and by treaty (primarily the Convention of International Trade in Endangered Species of Wild Fauna and Flora).

On July 24 the Senate adopted the Lacey Act Amendments of 1981 by unanimous vote in spite of very strong opposition to the bill by certain hunters' groups. House action, however, has been delayed and the fear is that this will allow big-game hunters time to press for a weaker bill.

Closely allied to the amended Lacey Act is the Endangered Species Act. Authorization for current expenditures under the Act expires at the end of fiscal year 1982. Reauthorization proceedings for the Act will commence in the near future. Dr. Campbell reports that endangered plants might face a special threat in view of the fact that statements have been made by certain congressmen to the effect that the Endangered Species Act should protect only mammals and birds.

Assistant Secretary G. Ray Arnett has established a formal order of priority for listing species in danger of extinction. Mammals lead the list with vascular plants following birds, fish, reptiles and amphibians, but ahead of insects, molluscs, other plants and other invertebrates. These rankings combined with other factors determine that the most threatened vascular plants cannot have a higher priority ranking than 11. Ecological and other scientific values are apparently not considered in the rankings.

By-Laws To Be Updated

Dr. Redfearn, President, has appointed a special committee to review the By-Laws of MoNPS. Dr. Dave Castaner (Department of Biology, Central Missouri State University, Warrensburg, Missouri 64093) is the chairman. Dr. Jim Henry Wilson and Dr. Wallace R. Weber will also serve on this committee. Suggestions for consideration may be sent to Dr. Castaner.

A Rat With Petals

Ginny Klomps
Missouri Department of Conservation
Jefferson City, MO

One of our duties as a native plant society is to protect our native flora. This includes eradication of introduced plants which threaten the existence of native species. Many of us are familiar with the problems caused by Kudzu in the south, and Japanese honeysuckle. We all have a chance, now, to prevent the spread of another troublesome plant--purple loosestrife, *Lythrum salicaria.*

Two years ago Becky Haefner sighted this plant in Macon County. This year it is abundant along Highway 63 and in other areas. At first glance one would doubt this beautiful plant with showy reddish-purple flowers could be harmful. In fact, the U.S. Fish and Wildlife Service has issued an alert for this introduced plant that is an aggressive invader of wetlands, choking out native emergent vegetation. It is likely to be dispersed by wildflower enthusiasts attracted by its showy blossoms. In fact it is being sold as a wildflower by some nurseries. Also, present wetland management techniques provide optimum conditions for local establishment.

The following information has been excerpted from the U. S. Fish and Wildlife Service. Please report any sightings to Dr. James R. Whitley, Water Quality Supervisor, F.W.S. Center, 1110 College Avenue, Columbia, MO 65201.

Reproduction and growth. Purple loosestrife sets seed starting in mid-July and is a prolific seed producer. Because the seeds can float for several days, colonization to the limits of high water can be expected.

It also reproduces from fragments of cut stems. Muskrat cuttings or mechanical clippings can hasten the spread and dominance of the plant if allowed to float within an impoundment.

Seedlings can become established on bare soil during an early summer drawdown. Once established, the plant can survive shallow flooding up to 12-18 inches in waters of low turbidity.

Control and Water Management Option. Purple loosestrife can be controlled in local areas accessible to machinery with combinations of mowing, spraying, and discing. But of course, the key to control is early recognition and removal by hand of the first plants to arrive.

Once it becomes firmly established in a large wetland or watershed, control becomes increasingly expensive and the wetland manager loses management options in shallow water regimes or moist-soil management. If it is possible to flood the entire basin to a depth of at least 3 feet for the entire growing season, purple loosestrife can be killed and native cattails/sedges be restored.

WHERE DO YOU PUT YOUR POISON IVY?

Rev. James M. Sullivan
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In Julian Steyermark's Flora of Missouri Poison Ivy is Rhus radicans L. In Robert Mohlenbrock's Guide to the Vascular Flora of Illinois Poison Ivy is Toxicodendron radicans (L.). It seems that for years botanists have been choosing sides as to whether Poison Ivy should be included in the genus Rhus or whether it and the Poisons Oak and Sumac are better segregated in their own genus Toxicodendron. Fernald and Gleason say Rhus. Rydberg and the old Britton and Brown say Toxicodendron. The debate goes on.

And so I faced the burning question: "Where do I put my Poison Ivy?" It was then that I realized that I was acquainted with a sumac expert that no one had yet consulted. "Why not ask my old friend, the Sumac Flea Beetle? He ought to know, if anyone would!" And so I got out the file record on Blepharida rhois (Forester), with entries of the times and plants of his occurrence. The picture was clear. The Sumac Flea Beetle feeds and breeds on Rhus glabra, Rhus copallina, Rhus aromatica and even on Cotinus obovatus which is also in the Anacardiaceae. He is extremely common on all these plants. But as to Poison Ivy: He wouldn't touch the stuff! "That settles it. Let's hear it for the genus Toxicodendron!"

Then I remembered: "There is another sumac-feeding flea beetle. I'll get his testimony too." Out came the file on Orthaltica copalina (Fabricius). "What's this!? The record was clear again. He regularly feeds and breeds on Rhus glabra, Rhus copallina, AND ON POISON IVY!!

What frustration; even the beetles are taking sides! But at least I have one consolation. I can sit back in my chair and smile as I reflect on what no one else knows: That Orthaltica copalina (Fabricius) is a Steyermarkian and Blepharida rhois (Forester) is a Mohlenbrockian.

TIMELY TIPS

The following article was excerpted from The New York Times of September 6, 1981 and was written by Dr. Richard B. Fischer, a professor of environmental education at Cornell University:

Goldenrods Have Many 'Treasures'

According to the late John Henry Comstock, celebrated American entomologist, "The goldenrod is a rich mine, yielding to the collector more treasures than any other flower." Yet this September wild flower has sometimes earned nothing but disdain from hayfever sufferers, who used to consider it an irritant, and from gardeners who may consider it a weed.

Research has set the record straight for hayfever claims and showed that ragweed, not goldenrod pollen, is the real culprit. Goldenrod pollen is heavy and constitutes an insignificant percentage of total pollen in the air. Although England has only two native species, British gardeners, ...who prize goldenrods, provide a place for them in their flower borders.

Americans have many reasons to admire this varied, handsome wild flower. It has an important role in the web of life that nature weaves. Goldenrods are food for many of the world's creatures -- beetles, bees and butterflies -- to name a few.

One beetle that I have seen only on goldenrods has the ponderous name Trirhabda canadensis. A hump-backed, three-striped critter, it could be dubbed the striped goldenrod beetle. By summer's end, its leaf-munching activities are strikingly evident.

Yet the beetle does no measurable harm for a stand of goldenrods will be just as vigorous next year. How many of these beetles serve as food for the insectivorous birds and insect-eating insects is anyone's guess.

Then there are the pollen eaters, insects such as the social polistes wasps and locust borer beetles whose larvae damage black locust trees. Honeybees make bee bread for their young. Rich in protein, pollen is a substance essential for growth.

Nectar, a carbohydrate or energy food, is eagerly sought by a host of insects. A large number of honey-bees will scramble over goldenrods and their close relatives, the asters, because these flowers offer the last big source of nectar before autumn frosts. Goldenrod honey is easily recognized by its dark color and somewhat tart taste.

Plant lice or aphids occur in large numbers near the tender tips of the flowers. These tiny sap-sucking machines are the chief food for ladybird beetles and their larvae not to mention goldeneyed lacewings, daddy longlegs and even the predacious larvae of the "sweat bees," (actually flies) that pollinate garden flowers.

One group of goldenrod dwellers keeps its activities well hidden or at least camouflaged. These are the gall makers, an odd assemblage of flies and moths that cause strange swellings on leaves, stems and flowers.

Probably best known and easily the most conspicuous is the round swelling seen on S. canadensis stems. Appropriately named the goldenrod ball gall, its maker is a handsome member of the peacock fly family. Expert taxonomist that it is, this fly unerringly lays eggs on Canada goldenrod and on no other.

When cut open the gall may reveal a plump, cream colored maggot inside. Or if none is there, chances are that a small, brown, seedlike object is. This is the pupa of a minute parasitic wasp which preys on no other creature than the fly maggot.

Predators, too, lurk in the bright blossom clusters and long green leaves of goldenrods. The ambush bug is a nondescript, misshapen blob, smaller than a Japanese beetle. What it lacks in size and good looks is more than compensated for by its patience and power. Hidden among the flowers and looking for all the world like a discolored bloom, it waits in ambush for one of the pollen eaters or nectar sippers. A lightning thrust, a sudden stab of the bug's beak and it's all over.

Spiders also stalk about in the goldenrod jungle. The crab spider departs from the classic web trap of its kin and hides among the flowers to snatch other insects which range in size from small flies to large bumblebees. A crab spider remains yellow in color on goldenrods but, transfer one to a daisy, and in a few days, it will turn white.

There are other goldenrod visitors. Goldfinches often build their cup-shaped nests in a tall clump of the Canada species. Nor will I soon forget the day one of my students spotted a gray tree frog resting on a stem. Since this particular frog was on a green plant, it had appropriately changed from gray to green, rendering it almost invisible!

VEGETATION OF HAWN STATE PARK

A thesis study entitled The Vegetation and Floristics of Hawn State Park, Ste. Genevieve County, Missouri was completed in August 1981 by Mary Kay Solecki, a graduate of Southern Illinois University - Carbondale. Quantitative analysis of the shortleaf pine-white oak forest which dominates the park is given. This includes a study of the composition and structure of the forest by indirect gradient analysis, dominance-diversity relationships, and size-class analysis. The relationship of selected environmental variables to vegetational patterns of the canopy and shrub-sapling strata is also discussed.

Natural communities are described following the Terrestrial Natural Community Classification for Missouri by Paul Nelson. These communities include a mesic sandstone forest, dry-mesic sandstone forest, dry sandstone forest, xeric sand forest, dry sandstone bluff, moist sandstone bluff, sandstone talus, sandstone overhang, sandstone glade, igneous glade, acid seep, gravel wash, and artificial areas.

Of the 661 vascular plant taxa collected, the following species are rare or endangered in Missouri: *Lycopodium tristachyum, Dennstaedtia punctilobula, Goodyera pubescens, Malaxis unifolia, Polygonum prolificum, Draba aprica, Ilex verticillata* var. *padifolia,* and *Viola mackloskeyi* var. *pallens.* Additionally, a taxa previously unrecorded from the state, *Geum virginianum,* was found growing along an abandoned logging road and in the campground lawn.

NEW COUNTY RECORDS OF SOUTHEASTERN MISSOURI SPECIES

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On May 5 of this year Carex triangularis was found in Otter Slough Wildlife Area in Stoddard County. This is the first record of this species in Missouri since it was found in a swamp in Dunklin County by B. F. Bush in 1892 and in Wayne County by Eggert in 1893. This species most closely resembles Carex annectens. In Carex triangularis the perigynia are deltoid-ovate, broadest just above the base and red-punctate, while, in Carex annectens the perigynia are ovate, broadest just below the middle and not punctate. Furthermore, Carex triangularis has the summit of the membranous inner band of its sheath of the upper leaves prolonged as a broad tongue, while Carex annectens has the summit truncate or only slightly rounded.

I believe that it is worthwhile mentioning that two other rare species of Carex that I found were Carex debilis var. debilis which is known only from Ripley and Stoddard Counties, and Carex laevivaginata which has been found in five counties in the southeastern quarter of Missouri. Although these are both rare species that haven't been found recently, they have been reported from Stoddard County, and are not new county records.

Eupatorium cuneifolium var. semiserratum was found in Otter Slough Wildlife Area. This is the fifth county record for this southeastern Missouri species.

Erigeron tenuis was growing along highway KK between H and N in Ripley County. This is a new county record for this mainly southwestern Missouri species.

Asclepias variegata was growing at the edge of a woods near a motel in Poplar Bluff, Butler County. It has been reported from seven other counties.

Ranunculus Sardous was found in a roadside ditch near the junction of highway 60 with Z and VV in Butler County. Although this is not a native species of Ranunculus, it previously was known only from St. Louis County.

Another species that isn't native, Lathyrus hirsutus, was growing along the roadside in the Mingo National Wildlife Refuge in Stoddard County. It has been found previously in St. Louis and Jasper Counties.

Also Vicia sativa var. nigra, not native, was growing in a drainage ditch near the junction of highway 60 with Z and VV in Butler County.

Planera aquatica was seen in Otter Slough Wildlife Area. This species has been recorded from the seven counties around Stoddard County, but not from Stoddard County itself.

Spermolepis echinata, five miles east of Poplar Bluff, Butler County, railroad tracks along highway 60; Potamogeton diversifolius, Otter Slough Wildlife Area, Stoddard County; and Phacelia gilioides, three miles east of Neelyville, Butler County, are also new county records for these more common species.

Specimens were given to the Missouri Botanical Garden Herbarium.

Missouri Natural Heritage Inventory

To Find the Last of the Least, and the Best of the Rest

Rebecca Haefner
Missouri Natural Heritage Inventory
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Suppose you had the responsibility of finding and purchasing tracts of land that exemplified the natural diversity of the state of Missouri. You'd probably first want to know the scope of the state's diversity: you'd want to know what exists so you could preserve a sample of each of the elements.

The money you receive to purchase the tracts will come to you in regular payments of variable amounts as long as you need it; but no one payment is large enough to purchase all you find. With the accelerating and unrelenting pace of development, you are eager to set preservation priorities and spend the dollars wisely. A reasonable strategy would be to "zero in" first on the most significant areas: These would be tracts that harbor rare plants and/or animals, and are threatened by development.

In Missouri it has already been begun by the Missouri Natural Areas Committee; composed of members of Department of Natural Resources and Missouri Department of Conservation it has managed, since 1970, to identify some 88 areas totalling 12,517 acres on which terrestrial or aquatic biological communities, or geologic sites, exist to-day in a natural or nearly undisturbed state. Such resources must be carefully conserved, as is recognized by those who understand that there is a basic interdependence among species, extending from mankind to the most inconspicuous organism...be it plant or animal. Fortunately, there are still many other relatively unspoiled such areas in Missouri, but there is at present no complete information about the diversity of life that these represent.

Therefore, the Missouri Natural Areas Committee authorized The Nature Conservancy (TNC) to develop the Missouri Natural Heritage Inventory (MONHI). Under a two-year contract with the Missouri Department of Natural Resources, TNC will develop an information management and analysis system that will compile, edit, and store data about elements of the state's natural diversity. Housed in the Department of Natural Resources, MONHI will seek to become the information integration branch of the Missouri Natural Areas Committee, thereby complementing and amplifying field survey techniques. The Nature Conservancy has been setting up these inventories throughout the nation to assist in the continuous collection of biological data.

The basic units in the Natural Heritage Inventory are the elements of diversity. These elements are defined as a natural feature of particular interest either because it is unique, explemplary, or endangered state or nationwide. Examples of elements include Mead's Milkweed, the Four-toed Salamander, the pondberry community near Naylor, Missouri, and a unique cave.

Previous natural areas inventories have been designed to operate on a site basis. With the element basis used by MONHI, the landscape is treated in terms of individual occurrences of element types. Therefore the "relative criticality" of an area can be determined by objective assessment: comparing "apples with apples", i.e. element occurrence with element occurrence.

Gathering and compiling data on an element basis, the MONHI will be capable of providing: 1) an index of relative rarity of elements (i.e. which elements have the fewest significant occurrences); 2) the status of current land protection in terms of elements (which occurrences are on already protected tracts of land within the state); 3) the ability to objectively compare the qualities of the recorded occurrences for individual elements; 4) the ability, through mapping processes to determine the spatial relationship between various element occurrences so as to select priority ensembles (or sites) for efficient protection efforts.

Missouri State Parks
A Natural Treasure House - Part II

John Karel - Department of Natural Resources*
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There are presently 43 state parks and they include approximately 96,000 acres. True to the best tradition of the state park concept, these relatively few acres include some of the finest examples of the major landforms of the state of Missouri: the bootheel swamps of southeastern Missouri, represented at Big Oak Tree; the St. Francois Mountain Region of the Ozarks, at Johnson's Shut-Ins, Elephant Rocks, and Sam A. Baker; the great Ozark springs at Roaring River, Bennett Spring, Montauk, and Ha Ha Tonka; the Ozark rivers at St. Francois, Meramec, and Washington; the great caves and karst landscapes at Ha Ha Ha Tonka and Rock Bridge Memorial; the gentle wooded hills of northern Missouri at Wallace, Crowder, and Thousand Hills; the Great Rivers that give special character to our state at Weston Bend, Van Meter, and Trail of Tears; and finally, the open plains of our western prairies at the new Prairie State Park.

Missouri State Parks contain or border more than 120 miles of permanent streams, including some of the finest fishing water in the state. There is frontage on the Missouri, Mississippi, Meramec, Current, Big, Black, St. Francois, and Locust Creek, not to mention numerous smaller, but high quality streams.

Over 90 caves have been recorded in state parks, including some of the longest (Devil's Icebox), and most unusual (Ozark Caverns). Missouri's most spectacular cave, Onondaga, has recently become a state park. Typically, the karst topography of such areas also includes sink-holes, springs and natural bridges, all nowhere better preserved than at Ha Ha Tonka State Park.

Of prairies, eleven separate tracts are presently being managed for native grasslands and one of these, Prairie State Park, has some of the finest tallgrass prairie in the Midwest.

Twenty tracts totalling 4,423 acres in the state parks have been designated as State Natural Areas. This designation is only given to those sites that are the very best examples of their natural communities or geological features in the state.

In addition, approximately 17,000 acres of the state park system have been incorporated in10 units of the Missouri Wild Area System. Wild Areas are large tracts of state land preserved for primitive recreational values. Northwoods Wild Area at Cuivre River State Park, Mudlick Mountain Wild Area at Sam A. Baker State Park, and Patterson Hollow at Lake of the Ozarks State Park are well known examples.

Further evidence of the significance of state parks is not difficult to find. For instance, large numbers of rare and endangered species find shelter on these lands. These include 39 species of plants at 48 sites and 26 species of animals at 39 sites. Plants and animals such as Goldie's fern, big tooth aspen, cucumber magnolia, Indiana bat, Swainsons warbler, and greater prairie chicken depend in whole or in part upon the state parks for their continued existence in Missouri, and DNR is firmly committed to protecting their habitat in the parks. The Department extends its care to the 22 specimens of tree that, as state champions, grow in one or another of the parks, and notes with pride that 7 of these are national champions for their species! Such facts point up the fact that the parks serve, and have always served, as refuges for all species of wildlife.

In summary, it is apparent that the state parks, with less than 100,000 acres, represent an extremely high quality natural system of public lands, a system in which conservationists take a strong interest, and for which we wish to maintain a wise stewardship. But in the past we have not always done so. Why not? If we may begin on a personal note, let me admit that upon entering the service of the state park agency four years ago, I had, even as an active citizen conservationist, only a very vague and limited concept of the natural values of the state parks. It has since been my observation that my then-limited understanding was and still is shared by many, if not most, of our fellow conservationists. Even though the history of the administration of the state parks shows a persistent, underlying realization of the preservation responsibilities of state parks, there has not always been a major effort made to project preservation values to the public.

Furthermore, many of us tend to base our estimates of park values solely on what may be visible from our windshields. How many of us, for example, know that at Roaring River State Park, beyond the motel, modern cabins, dining lodge, and sometimes - crowded roads and streambanks, there are thousands of acres of seldom-visited natural woodland, a 2,000 acre Wild Area, a 160 acre Natural Area, habitat for three rare and endangered animals, including the Oklahoma Salamander, habitat for six species of rare or endangered plants, including the beautiful yellowwood tree, the state champion species of Ozark chinquapin, and 6 miles of hiking trails through some of the most rugged and unspoiled terrain of the southwestern Ozarks.

If we conservationists cast off some outworn images, and look more closely at the park, what do we find? Besides the resources described earlier, we find evidence of increased capabilities to provide wise, long-term stewardship of park resources.

In the area of personnel, professionalism has been strongly emphasized with upgraded job qualifications for new employees, protection through the merit system and expanded training programs.

Interpretive efforts have been strengthened with the addition of new full-time park naturalists.

Scientific research has expanded greatly in the parks through contacts with Missouri's colleges and universities and the awarding of several mini-grants. One important research project has just been completed in-house, an inventory of natural area resources in parks.

Where conditions call for it, special ecological management has been applied, particularly in the area of native grassland restoration.

New efforts have been made to provide better information to the public about their state park system, including better brochures, slide shows, and maps.

Despite these advances, we find that the parks still need help and lots of it. Many of the programs mentioned above need to be strengthened or expanded. The system itself still does not incorporate adequate representation of all of Missouri's landforms. Inholdings in some of the parks have developed into a severe problem. Solving these problems will take additional funding.

In addition, a changing Missouri environment has begun to have a negative effect in some of our parks and could, if not checked, have increasingly bad effects on more and more parks. Some of these changes include air pollution, water pollution, noise pollution, encroachments by highways, drainage projects, subdivisions, and utility lines. In some parks, people themselves can be a threat, especially in instances of overcrowding and/or the use of off-road vehicles.

All of these challenges can be met in part by strong leadership and better funding; but it will also require more than just these to keep the quality of public holdings at first-rate levels. In the long run, the only effective guardian of natural values on public land is an aware, vigilant, and aggressive constituency.

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*Much of this material appeared in Missouri Wildlife, February, 1981, and is reprinted with permission.

HELP WANTED

As part of a systematic study of the genus Callirhoe (Malvaceae) I am attempting to make artificial crosses between all of the taxa in the genus. I already have a number of taxa in cultivation, but I do not have any living material of Callirhoe digitata Nutt. or C. bushii Fern. (=C. papaver var. bushii (Fern.) Waterfall), both of which are found in southwestern Missouri. I would therefore greatly appreciate receiving any collections of mature seed (vouchered with locality data).

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